

2012**M.Sc.****3rd Semester Examination****BIOCHEMISTRY****PAPER—BIC-301***Full Marks : 40**Time : 2 Hours*

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

1. Answer any five questions from the following : 2×5
- (a) What is intrinsic viscosity?
 - (b) What do you mean by 'zero point energy'? Express its mathematical form.
 - (c) What is recombinant vaccine?
 - (d) Define molar absorption co-efficient of a substance related to Beer-Lambert Law and what is its unit?
 - (e) Define Rayleigh scattering and Raman scattering.

(Turn Over)

- (f) Write down the mobile phases and stationary phases of the following chromatographic technique—
- (i) Paper chromatography;
 - (ii) TLC;
 - (iii) Column chromatography;
 - (iv) Ion exchange chromatography.
- (g) What is meant by isoelectric focussing?
- (h) What is 'Pulsed field Gel Electrophoresis'?

2. Answer any *two* questions from the following : 5×2

- (a) Write down the effects of H-bonding and resonance on IR spectra of molecules.
- (b) With respect to DNA, what is the limitation of agarose gel electrophoresis technique? Keeping the gel material same, how can you overcome the limitation? For DNA electrophoresis, when polyacrylamide is used?
- $1\frac{1}{2} + 2\frac{1}{2} + 1$
- (c) Briefly discuss the comparative studies on UV-Vis-spectroscopy and CD spectroscopy.
- (d) How do you prepare the sample for cryo-electron microscopy?

3. Answer any two questions from the following : 10×2

(a) What is the basic theory of NMR spectroscopy? Discuss briefly its use in determining protein structure.

5+5

(b) Write down the principle of centrifugation. With suitable flowchart describe the separation of cell organelles from an intact liver tissue by using ultracentrifugation.

3+7

(c) What is X-ray crystallography? Write down its advantages of using over UV-visible spectroscopy. Mention its application in biology.

2+4+4

(d) What is HAT selection? How does Hybridoma Technology help in 'monoclonal antibody' preparation? Explain the importance of agglutination in biology with example.

3+4+3